भारतीय मानक
Indian Standard

IS 11923 : 2022

कोको मास
(कोको/चॉकलेट द्रव) — विशिष्टि

(पहला पुनरीक्षण)

Cocoa Mass (Cocoa/Chocolate Liquor) — Specification

(First Revision)

ICS 67.140.30

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भारतीय मानक ब्यूरो
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February 2022 **Price Group 5**

Stimulant Foods Sectional Committee, FAD 06

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Stimulant Foods Sectional Committee had been approved by the Food and Agriculture Division Council.

Cocoa mass (also known as cocoa/chocolate liquor) is made from ground cocoa beans that have been fermented, dried, roasted and separated from their skins. Quality estimation of 'cocoa mass (cocoa/chocolate liquor)' assumes importance, because it is marketed as a finished product and is used as a major ingredient/raw material in the manufacture of chocolate, chocolate coating, cocoa beverages, bakery goods and confectionery.

The standard was first published in 1986, and this first revision has been undertaken to align the requirements of cocoa mass (cocoa/chocolate liquor) with the specifications laid down in the *Food Safety and Standards* (*Food Products Standards and Food Additives*) *Regulations,* 2011. Accordingly, the requirements of moisture, fat, alkalinity of ash and acid insoluble ash have been modified and requirement of cocoa shell and germ has been incorporated.

In the formulation of this standard, due consideration has been given to the provisions of the *Food Safety and Standards Act*, 2006 and the *Rules* and *Regulations* framed thereunder and the *Legal Metrology* (*Packaged Commodities*) *Rules*, 2011. However, this standard is subject to the restrictions imposed under these, wherever applicable.

The composition of the Committee responsible for formulation of the standard is given in Annex J.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

COCOA MASS (COCOA/CHOCOLATE LIQUOR) — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and method of sampling and test for cocoa mass (cocoa/chocolate liquor).

2 REFERENCES

The standards given below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

IS No.	*Title*
265 : 2021	Hydrochloric acid (*fifth revision*)
321 : 1964	Specification for absolute alcohol (*revised*)
336 : 2021	Specification for ether (*third revision*)
2214 : 1977	Specification for silver nitrate, pure, and analytical reagent (*first revision*)
2491 : 2013	Food hygiene — General principles — Code of practice (*third revision*)
5403 : 1999	Method for yeast and mould count of foodstuffs and animal feeds (*first revision*)
5887 (Part 1) : 1976	Methods for detection of bacteria responsible for food poisoning — Part 1 Isolation, identification and enumeration of *Escherichia coli* (*first revision*)
5402 (Part 1) : 2021/ ISO 4833-1 : 2013	Microbiology of the food chain — Horizontal method for the enumeration of microorganisms: Part 1 Colony count at 30 °C by the pour plate technique (*third revision*)

3 REQUIREMENTS

3.1 Description

Cocoa mass (cocoa/chocolate liquor) shall be a solid or semisolid material prepared by cocoa beans, the seeds of *Theobroma cacao* by adequate grinding of clean, practically shell free nibs (cotyledons) with or without roasting, and with or without removal or addition of any of its constituents.

3.2 The product shall have its characteristic colour, odour and flavour and it shall be free from any added colouring matter, flavour, or added fats other than cocoa butter.

3.3 The product shall also comply with the requirements given in Table 1.

3.4 Optional Treatment and Ingredients

3.4.1 The material may at any stage during its manufacture be treated with alkalizing agents, such as hydroxides, carbonates and bicarbonates of sodium, potassium, magnesium and aluminum only not exceeding 5 percent singly or in combination and expressed as anhydrous potassium carbonate on fat free basis. The maximum level of neutralizing agents used, namely, citric, tartaric or phosphoric acid shall be 0.5 percent in the final product.

3.4.2 For alkalized cocoa mass, the requirements at Sl No. (iii), (v) and (vi) of Table 1 shall be as under:

a) *p*H — 6 ± 0.5;

b) Total ash (on moisture and fat free basis) percent by mass, *Max* — 14; and

c) Alkalinity of ash (on moisture and fat free basis), percent by mass, *Max* — 7.

3.5 Food Additives

The product may contain the food additives, as permitted under the *Food Safety and Standards* (*Food Products Standards and Food Additives*) *Regulations,* 2011.

3.6 Contaminants, Toxins and Residues

The pesticide residues, heavy metals, toxins (aflatoxins and other naturally occurring toxins, if any) in the

Table 1 Requirements for Cocoa Mass (Cocoa/Chocolate Liquor)

(*Clause* 3.3)

Sl No. (1)	Characteristics (2)	Requirement (3)	Method of Test, Ref to (4)
i)	Moisture, percent by mass, *Max*	10.0	Annex A
ii)	Fat (cocoa butter), percent by mass, moisture-free basis	47.0 – 60.0	Annex B
iii)	*p*H	5 ± 0.5	
iv)	Cocoa shell and germ, percent by mass, *Max*		AOAC 968.10
	a) Calculated on fat-free dry matter basis	5.0	and
	b) Calculated on an alkali free basis (for cocoa shell only)	1.75	AOAC 970.23
v)	Total ash, percent by mass, moisture and fat free basis, *Max.*	8.0	Annex C
vi)	Alkalinity of total ash as K_2O, percent by mass (on moisture and fat free basis), *Max*	12.0	Annex D
vii)	Acid insoluble ash, percent by mass (on moisture and fat free basis), *Max*	1.0	Annex E
viii)	Crude fibre, percent by mass (on moisture and fat free basis), *Max*	7.0	Annex F
ix)	Particle size, percent material passing through 150 mesh, *Min.* (wet sieving)	99	Annex G
x)	Aerobic plate count, per g, *Max*	50,000	IS 5402 (Part 1)
xi)	Yeast and mould per g, *Max*	100	IS 5403
xii)	*E. coli*	Absent/g	IS 5887 (Part 1)

product shall not exceed the limits as prescribed in the *Food Safety and Standards* (*Contaminants, toxins and Residues*) *Regulations*, 2011.

3.7 Hygienic Conditions

The product covered by the provisions of this standard shall be manufactured, packed and stored under hygienic conditions in licensed premises (*see* IS 2491).

4 PACKING AND MARKING

4.1 Packing

The product shall be packed in clean, sound and odour free containers made of tin plate, plastic, grease proof paper and aluminum foil, as agreed to between the purchaser and the vendor. The product shall be packed in quantities as stipulated under the *Legal Metrology* (*Packaged Commodities*) *Rules*, 2011 as well as in accordance with requirements under the *Food Safety and Standards* (*Packaging*) *Regulations*, 2018.

4.2 Marking

4.2.1 The following particulars shall be marked or labelled legibly and indelibly on each container:

a) Name of the material, that is, ‘Cocoa Mass or cocoa/chocolate liquor’ or ‘Alkalized cocoa mass’ and brand name (if any);
b) Name and address of the manufacturer;
c) Batch or code number;
d) Month and year of manufacture;
e) Net quantity;
f) Best before……......month……….year;
g) Directions for storage; and
h) Any other information required under the *Legal Metrology* (*Packaged Commodities*) *Rules,* 2011 and the *Food Safety and Standards* (*Labelling and Display*) *Regulations,* 2020.

4.2.2 *BIS Certification Marking*

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

5 SAMPLING

The method of drawing representative sample of the material and the criteria for conformity shall be as prescribed in Annex H.

ANNEX A

[*Table* 1, *Sl No.* (i)]

DETERMINATION OF MOISTURE

A-1 PROCEDURE

A-1.1 Preparation of Sample

Cool the material until hard and then grate or shear to a fine granular condition.

A-1.2 Vacuum Oven Method

Weigh accurately about 10 g of the prepared sample (*see* **A-1.1**) in a tared weighing bottle having a diameter of about 40 mm and a height of about 25 mm. Distribute the material as evenly as possible over the bottom of the bottle by gentle tapping. Place the bottle in a vaccum oven, remove the cover of the bottle and dry the material for 6 h at 80 ± 1 °C at a pressure not exceeding 5 mm of mercury. Allow the bottle to cool to room temperature and weigh.

A-1.3 Air Oven Method

Weigh accurately about 2 g of the sample (*see* **A-1.1**) in a petri dish tared with its cover. Distribute the material as evenly as possible over the bottom of the petri dish by gentle tapping. Place the dish in an oven set at 105 ± 2 °C. Remove the cover and place it next to the dish. Dry for 3 h and cool in a desiccator for about 20 min. Weigh and repeat drying for 30 min intervals till the difference between two successive weighing is not more than 1 mg.

A-2 CALCULATION

$$\text{Moisture, percent by mass} = \frac{100\,(M_1 - M_2)}{M}$$

where

M_1 = mass in g, of the prepared sample taken for the test, and

M_2 = mass in g, of the material after drying.

ANNEX B

[*Table* 1, *Sl No.* (ii)]

DETERMINATION OF FAT

B-1 PRINCIPLE

The fat in cocoa mass (cocoa/chocolate liquor) is enclosed by cellulose. It is liberated by digesting with hydrochloric acid. The digested material is filtered in a suitable manner to remove the acid solution, it is dried and the fat is then extracted in a soxhlet apparatus, and the residual fat in the flask dried and weighed.

B-2 REAGENTS

B-2.1 Hydrochloric acid, chemically pure, 25 percent by weight (Sp Gr 1.12) (*see* IS 265).

B-2.2 Petroleum ether, dried, freshly distilled, boiling point below 60 °C.

B-2.3 0.1 N silver nitrate solution ($AgNO_3$) (*see* IS 2214).

B-3 PROCEDURE

B-3.1 Digesting the Sample

Weigh 3 to 4 g of sample prepared in **A-1.1** in a 500 ml beaker accurately. Add 45 ml of boiling hot distilled water into the beaker and stir to give a homogenous suspension. Again stirring continuously, add 55 ml of 25 percent hydrochloric acid (giving 4 N HCl). Add a few defatted, incinerated pieces of pumice stone or pumice powder. Cover the beaker with a watch glass or connect it to a reflux condenser in order to avoid losses by splashing and to prevent the acid from becoming too concentrated due to evaporation of the water. Bring the contents of the beaker slowly to boiling point. When boiling starts, remove the flame momentarily to avoid overflowing. Boil the contents gently for about 15 min. Rinse watch glass or condenser used above into the beaker with 100 ml of boiling water. Filter the digest while still hot through a wetted, fat free, fluted filter paper of such a pore size as to allow the filtration to proceed at a reasonable speed. Wash the beaker several times with hot water and also pass the washings through the filter paper. Wash the filter paper with several further lots of hot water until the filtrate ceases to give a chloride reaction with silver nitrate. While still wet, transfer the filter paper with sample to a defatted extraction thimble and dry in a small beaker for up to 6 h at 100-101 °C.

B-3.2 Extraction

Place a few pieces of pumice stone into a 250 ml flat bottomed Soxhlet flask and dry for 1 h in an oven at 100-101 °C. Cool the flask in a desiccator for 30 min and accurately weigh on an analytical balance. Place the thimble containing the dried filter paper with the digested sample into a soxhlet extractor. Rinse the beaker (dried) which was used for the digestion several times with petroleum ether and pour the washings into the thistle with soxhlet extractor. Extract the digested sample and the filter paper under a reflux condenser for 4 h using 40-50 ml petroleum ether. After completion, distil off the petroleum ether on a water bath and dry the flask with the fat, lying, on its side, either under vacuum at 70 °C, or in on an oven at 100-101 °C. After drying, remove the last traces of ether by blowing air into the flask using a rubber balloon. Cool the flask for 30 minutes in a desiccator at room temperature. Reweigh on an analytical balance.

B-4 CALCULATION

Fat (on moisture free basis), percent by mass =

$$\frac{10\,000 \times A}{M_1 \times S}$$

where

A = extracted fat in the flask, in g;

M_1 = mass of sample in g; and

S = percent dry matter, in sample.

ANNEX C

[*Table* 1, *Sl No.* (v)]

DETERMINATION OF TOTAL ASH

C-1 PROCEDURE

Weigh accurately about 10 g of the material in a porcelain dish. Heat at 100 °C until water is expelled and then heat slowly over a flame until swelling ceased. Ignite in a muffle furnace at 550 °C until grey ash results. Cool in a desiccator and weigh. Repeat the process of igniting, cooling and weighing at half hour intervals until the difference in mass between two successive weighings is less than one milligram.

C-2 CALCULATION

Total ash (on moisture and fat free basis), percent by mass =

$$\frac{10\,000\, m_1}{m_2[100 - (M + F)}$$

where

m_1 = mass in g, of the ash;

m_2 = mass in g of the prepared sample taken for test;

F = fat (on as is basis), percent by mass in the prepared sample; and

M = moisture, percent by mass, in the material (*see* **A-2**).

ANNEX D

[*Table* 1, *Sl No.* (vi)]

DETERMINATION OF ALKALINITY OF ASH

D-1 REAGENTS

D-1.1 Dilute Hydrochloric Acid, approximately 0.1 N

D-1.2 Standard Sodium Hydroxide, approximately 0.1 N, accurately standardized.

D-2 PROCEDURE

D-2.1 Weigh accurately about 2 g of the material, and ash as prescribed in **C-1**. Add a known excess of dilute hydrochloric acid and boil for 2 min. Cool and titrate the excess of acid against standard sodium hydrochloride using bromocresol in green as indicator till the colour changes to green.

D-2.1.1 Titrate 10 ml of dilute hydrochloric acid against the standard sodium hydroxide using phenolphthalein as indicator till the colour changes to pink.

D-3 CALCULATION

Alkalinity of ash (as K_2O) (on moisture and fat free basis), percent by mass:

$$\frac{47.1\,N\left(\frac{V_2-V_1-V_3}{10}\right)}{m\,[100-(M+F)}$$

where

N = normality of standard sodium hydroxide (*see* **D-1.2**);

V_2 = volume in ml, of dilute HCI added (*see* **D-2.1.1**);

V_1 = volume in ml, of standard sodium hydroxide corresponding to 10 ml of dilute hydrochloric acid

V_3 = volume in ml, of standard sodium hydroxide required for the excess of acid;

m = mass in g, of the material taken for the test (*see* **D-2.1**);

M = mass, percent m/m, in the material **(***see* **A-2**); and

F = fat (cocoa butter); percent by mass, in the material (*see* **B-4**).

ANNEX E

[*Table* 1, *Sl No.* (vii)]

DETERMINATION OF ACID INSOLUBLE ASH

E-1 REAGENT

E-1.1 Dilute Hydrochloric Acid, approximately 5 N, prepared from concentrated hydrochloric acid |(*see* IS 265).

E-2 PROCEDURE

To the ash contained in the dish (*see* **C-1**), add 25 ml of dilute hydrochloric acid, cover with a watch glass and heat on a boiling water bath for 10 min. Allow to cool and filter the contents of the dish through Whatman filter paper No. 42 or its equivalent. Wash the filter paper until the washings are free from the acid. Return the filter paper and residue to the dish. Keep it in an electric air oven maintained at 135 + 2 °C for about 3 h. Cool the dish in a desiccator and weigh. Repeat the process of igniting in a muffle furnace, cooling and weighing on half hour intervals until the difference in mass between two successive weighings is less than 1 mg. Note the lowest mass.

E-3 CALCULATION

Acid insoluble ash (on moisture and fat free basis), percent by mass

$$= \frac{10\,000\,m_1}{m_2\,[100-(M+F)]}$$

where,

m_1 = mass in g, of the acid insoluble ash;

m_2 = mass in g, of the prepared sample taken for the test;

M = moisture, percent by mass in the prepared sample (**A-2**); and

F = fat (on as is basis), percent by mass, in the prepared sample.

ANNEX F

[*Table* 1, *Sl No.* (viii)]

DETERMINATION OF CRUDE FIBRE

F-1 REAGENTS

F-1.1 Ether, solvent grade (*see* IS 336).

F-1.2 Ethyl Alcohol (*see* IS 321).

F-1.3 Sodium Oxalate Solution, one percent (*m*/*v*).

F-1.4 Dilute Sulphuric Acid, 1.25 percent (*m*/*v*), accurately prepared.

F-1.5 Sodium Hydrochloride Solution, 1.25 percent (*m*/*v*) accurately prepared.

F-1.6 Asbestos, Gooch-grade, medium fibre, acid-washed and ignited.

F-2 PROCEDURE

F-2.1 Preparation of Moisture and Fat Free Material

Treat 7 g of the prepared sample (**A-1.1**) in a centrifuge bottle twice, with 100 ml of ether. Centrifuge and decant supernatant liquid after each addition of ether. Dry the residue in an air-oven at 100 ± 2 °C and powder it with a flattened glass rod. Wash with 100 ml of water centrifuge for 10 min and decant the aqueous alcohol twice and with 100 ml of ether once, in the same manner as with water. Transfer the moisture and fat-free residue to a dish and dry it to constant mass in an air-oven at 105 °C. Use this for the determination of crude fibre (**F-2.2**).

F-2.2 Weigh accurately above 2.5 g of the residue (**F-2.1**) and transfer to a liter flask. Take 200 ml of dilute sulphuric acid in a beaker and bring to the boil. Transfer the whole of the boiling acid to the flask containing the residue and immediately connect the flask with a reflux water condenser and heat, so that the contents of the flask begin to boil within one minute. Rotate the flask frequently, taking care to keep the material from remaining on the sides of the flask out of contact with the acid. Continue boiling for exactly 30 min. Remove the flask and filter through fine linen (about 18 threads to a centimeter) held in a funnel, and wash with boiling water until the washings are no longer acid to litmus. Heat some quantity of sodium hydroxide solution to boiling under a reflux condenser. Wash the residue on the linen into the flask with 200 ml of the boiling sodium hydroxide solution. Immediately connect the flask with the reflux condenser and boil for exactly 30 min. Remove the flask and immediately filter through the filtering cloth. Thoroughly wash the residue with boiling water and transfer to a Gooch crucible prepared with a thin but compact layer of the ignited asbestos **(F-1.6)**. Wash the residue thoroughly first with hot water and then with about 15 ml of ethyl alcohol, 95 percent by volume. Dry the Gooch crucible and contents at 105°C in an air-oven to constant mass, cool and weigh. Incinerate the contents of the Gooch crucible in a muffle furnace at 600 ± 20 °C until all the carbonaceous matter is burnt. Cool the Gooch crucible containing the ash in a desiccator and weigh.

F-3 CALCULATION

Crude fibre (on moisture, fat, sugar and milk free basis), percent by mass:

$$= \frac{100\, M_1 - M_2)}{M_3}$$

where

M_1 = mass in g, of Gooch crucible and contents before ashing;

M_2 = mass in g, of Gooch crucible containing asbestos and ash; and

M_3 = mass in g, of the residue taken for the test (**F-2.2**).

ANNEX G

[*Table* 1, *Sl. No.* (ix)]

DETERMINATION OF PARTICLE SIZE

G-1 APPARATUS

G-1.1 Sieve

The sieve comprises a 7.5 cm diameter hollow cylinder of tinned copper 6 cm high to which is a long hoop. The base of the sieve is flanged and covered with standard wire gauze, 150 mesh, and soldered all round the edge. A metal ring is soldered on the lower side of the gauge to protect the sieve when standing on the bench.

G-1.2 Desiccator

90 cm diameter approximately with tight lids.

G-2 REAGENT

G-2.1 Petroleum Ether, boiling range 60-80 °C.

G-3 PROCEDURE

Place 25 g liquor in the sieve and lower gently into the desiccator containing petroleum ether, at an angle of 30° to the horizontal. Cover the desiccator and gently rotate it avoiding splashing of ether with material passed through the sieve to come back into it. When the sieve is somewhat less than a quarter full, slightly withdraw it so that about half the gauge is below the surface of the petroleum ether in the vessel. When the volume in the sieve has been reduced appreciably, lower the sieve until it is again somewhat less than a quarter full and drain as before. Repeat the process for 5 min, maintaining the gentle swirling motion throughout. Transfer the sieve to the second desiccator containing clean petroleum ether. Wash down any liquor clinging to the walls using a wash bottle of petroleum ether. Complete sieving by repeatedly dipping and draining to achieve appearance of appreciably coarse cocoa on the sieve. Dry the sieve in an air oven for 10 min. Transfer the cocoa tailings to a tared dish using a small brush and weigh.

ANNEX H

(*Clause* 5)

SAMPLING OF COCOA MASS

H-1 GENERAL REQUIREMENTS OF SAMPLING

H-1.0 In drawing, preparing, storing and handling samples, the following precautions and directions shall be observed.

H-1.1 Samples shall be taken in a protected place not exposed to damp air, dust or soot.

H-1.2 The sampling instrument shall be clean and dry when used.

H-1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and containers for samples from adventitious contamination.

H-1.4 The samples shall be placed in clean and dry glass containers. The sample containers shall be of such a size that they are almost completely filled by the sample.

H-1.5 Each container shall be sealed air-tight after filling and marked with full details of sampling, batch or code number, name of the manufacturer and other important particulars of the consignment.

H-2 SCALE OF SAMPLING

H-2.1 Lot

All the containers in a single consignment of the material drawn from a single batch of manufacture shall constitute a lot.

H-2.1.1 From each lot, samples shall be tested to ascertain the conformity of the material.

H-2.2 The number of containers to be selected randomly. Selection shall depend on the size N of the lot and shall be in accordance with co1 1 and 2 of Table 2.

Table 2 Numbers of Containers to be Selected for Sampling

(*Clause* H-2.2)

Lot Size N (1)	Sample Size n (2)
5 to 100	3
101 to 300	5
301 to 500	7
501 and above	9

H-3 PREPARATION OF TEST SAMPLES AND REFEREE SAMPLE

H-3.1 About 250 g of the material shall be taken from each of the selected containers after melting the contents at 55°C and mixing them thoroughly with a sampling tube.

H-3.2 Preparation of Composite Sample

Equal quantities of material (about 100 g) shall be taken from the sample as obtained in **H-3.1** and mixed thoroughly to constitute a composite sample of size 300 g. This sample shall be divided into three equal parts, one for the purchaser, one for the vendor and the third one for the referee. The test samples so obtained shall be transferred immediately to thoroughly clean and dry containers and sealed air-tight. These shall be labelled with particulars of sampling given in **H-1.5**.

H-3.3 Preparation of Individual Sample

The remaining portions of the material from each of the selected containers (after the required quantity needed for formation of the composite sample) shall be divided into three equal parts. These parts shall be immediately transferred to thoroughly dried containers which are then sealed air-tight and labelled with all the particulars given in **H-1.5**.

H-3.4 Referee Samples

Referee samples shall consist of the composite sample (*see* **H-3.2**) and a set of individual test samples (*see* **H-3.3**) marked for this purpose and shall bear the seals of the purchaser and the vendor. These shall be kept at a place agreed to between the two.

H-4 NUMBER OF TESTS

H-4.1 The test for the description, total fat, total ash, acid insoluble ash, alkalinity of ash, and crude fibre shall be conducted on the individual samples as obtained in **H-3.3**.

H-4.2 The test for remaining characteristics shall be made in the composite sample as prepared under **H-3.2**.

H-5 CRITERIA FOR CONFORMITY

H-5.1 A lot shall be declared as conforming to the requirements of this standard if **H-5.1.1** and **H-5.1.2** are satisfied.

H-5.1.1 Each of the test results obtained for various characteristics from individual testing (*see* **H-4**) shall satisfy the corresponding requirements as given in **3**.

H-5.1.2 The test results on the composite sample for the characteristics specified in Table 1 shall satisfy the corresponding requirements given in Table 1.

ANNEX J

(*Foreword*)

COMMITTEE COMPOSITION

Stimulant Foods Sectional Committee, FAD 06

Organization	*Representative(s)*
Tea Board India, Kolkata	Dr Biswajit Bera (***Chairman***)
Agricultural and Processed Food Products Export Development Authority (APEDA), New Delhi	Shri Devendra Prasad
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Consumer Research, Education, Action, Training and Empowerment (CREATE), Tamil Nadu	Prof Dr Duraisingam Mr K. Suresh Kanna (*Alternate*)
Defence Food Research Laboratory (DFRL), Mysore	Dr T. Anand Dr Rudragoud Policegoundra (*Alternate*)
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Scientist 'D' (FAD), BIS

Bureau of Indian Standards

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc No.: FAD 06 (17092).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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KOLKATA 700054
2337 8499, 2337 8561
2337 8626, 2337 9120

Northern : Plot No. 4-A, Sector 27-B, Madhya Marg
CHANDIGARH 160019
265 0206
265 0290

Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113
2254 1216, 2254 1442
2254 2519, 2254 2315

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
MUMBAI 400093
2832 9295, 2832 7858
2832 7891, 2832 7892

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Published by BIS, New Delhi